

PATENT SPECIFICATION

1,188,881

DRAWINGS ATTACHED.

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COMPLETE SPECIFICATION.

Improvements in or relating to Freight Containers.

I, HANS KARL KLOESS, of Obere Rötels-
strasse 20 Zug, Switzerland, a German
Citizen, do hereby declare the invention,
for which I pray that a patent may be
granted to me, and the method by which
it is to be performed, to be particularly
described in and by the following state-
ment:—

The invention relates to containers with
detachable tops, or so-called open top con-
tainers. These containers form one of the
two main groups of containers developed in
accordance with the recommendations of
the ISO.

It is known to cover containers by a
tarpaulin which is either tightened over
the top or folded together in the open top.

These known constructions have the
drawback that the tarpaulin can be easily
damaged and that it cannot support any
load.

The present invention seeks to provide
a container with a detachable top cover
which is easily removable, ensures a com-
plete seal against water and can be loaded
in the same way as the fixed roof of known
containers.

According to the present invention, I
provide a freight container comprising a de-
tachably top cover in the form of a sub-
stantially flat insert with a skeleton frame
and a lining, having on the underside of its
periphery a U-shaped groove or channel
with a resiliently deformable seal embedded
therein, the outer leg of the groove or
channel extending beyond the surface of
the seal and the upper edge of the container
being formed with a rebate providing an
inwardly directed horizontal ledge and hav-
ing an upstanding sealing lip for co-operat-
ing with the seal, and including manually
operated locking devices arranged in up-

wardly opening pockets distributed adja-
cent the periphery of the cover.

Preferably, the locking devices each con-
sist of a locking lever hinged to the cover,
the reaction at the hinge producing a sub-
stantially vertically downwardly directed
locking force, said locking levers being
adapted to be swung into the profile of the
cover, and a pivotally mounted manual
lever, the two levers being so connected by
a link member that, in the locked position,
the hinge joint between the manual lever and
the connecting link moves beyond a dead
centre position defined by the pivot for
the manual lever and the hinge for the lock-
ing lever, and including pockets opening
towards the cover in the rebate opposite
the locking levers, and forming an abut-
ment for the locking levers. Preferably, in
the locked position, the manual lever rests
on a stop member to prevent the hinge
joint from swinging anticlockwise about the
pivot point of the locking lever to the cover,
under the contact force of the locking lever,
thus neutralizing the locking effect.

In order to avoid the manual lever pro-
jecting beyond the surface of the cover when
the locking device is open, the hinge of
the manual lever is preferably detachable.
To this end the manual lever may be
equipped with lateral hinge pins which en-
gage into upwardly opening bearing grooves
of two bearing plates arranged in mutually
spaced relationship.

In order to locate the locking device in
the inoperative position, the end of the
manual lever is preferably angled and the
pockets have a ball shaped recess behind
the support for the manual lever in the
locked position into which the ball head of
the manual lever may be fitted.

For mounting the cover, the pockets

nearest the corners preferably have eyelets pivotally mounted on the base of the pockets, the joint being preferably such that, in the locked position, the eyelet is below the manual lever and can be operated only when the locking mechanism is released.

It may be convenient, particularly with long containers, for example those with a length of 40 ft., to provide, in addition to locking devices acting on the cover with a pressure acting downwardly on to the container, transverse locking devices which may also be arranged in corresponding pockets. These transverse locking devices preferably comprise a manual lever hinged to the cover, to which is articulated a pull rod whose end cooperates with an abutment in the upper frame in such a way that the connecting joint is beyond the dead centre position when the locking device is locked. Preferably the free end of the pull rod has hammer head shaped projections and the upright leg of the rebate carries an upwardly opening pocket preferably formed with resilient abutments for these hammer head shaped projections.

In one embodiment, a top for a container may be provided with a locking device acting simultaneously in the vertical and transverse directions. In this construction, the locking lever has a gib surface forming an angle of about 45° with the vertical and co-operating with a corresponding surface in the rebate of the upper rim of the container. In order to produce a constant and uniform locking force even with flexing of the rim, the inclined surface is arranged conveniently on a separate lever, arranged preferably to pivot about the same axis as the locking lever, and a compression spring is arranged between these two parts.

Open top containers are frequently loaded with fork lift trucks. In order to facilitate the anchoring of the fork lift truck it is known to provide a detachable cross spar. In known containers, the upper cross spar of the door is pivotable and must be swivelled out in an additional operation after the roof has been opened. A disadvantage here is that the cross bar projects beyond the outer walls of the container and thereby obstructs loading.

Preferably, therefore, I provide a container in which the upper cross spar of the door is firmly connected with the detachable roof and in which the cross bar is removed automatically when the top cover is lifted.

It has been shown in practice that during loading, the side posts of the door tend to tilt inwardly or outwardly. Hence these door posts must be re-aligned before the upper cross spar is fitted.

I therefore provide preferably a locking bar mounted rotatably on a pivoting arm located on one of the door posts, and into

which engages a screwed spindle fitted on a pivoting arm mounted on the other door post. Conveniently the screwed spindle is detachably connected with the associated pivoting arm.

The invention will be further described by way of example with reference to the accompanying drawings, in which:—

Figure 1 shows in perspective a container with a detachable top cover according to the invention;

Figure 2 is a cross section along the line II—II in Figure 1, with the cover on the container.

Figure 3 is a top view of a container according to Figure 1 with fitted cover;

Figure 4 is a cross section along the line IV—IV in Figure 3 and shows a locking mechanism in the locked position and in the unlocked position;

Figure 5 shows a modification of the locking lever;

Figure 6 shows a cross section of a cover pocket with transverse locking device;

Figure 7 is a top view in the direction of the arrow VII in Figure 6;

Figure 8 is a perspective view of a further embodiment in which the upper cross spar of the door is detachable and firmly connected with the cover;

Figure 9 shows the upper part of the door opening with a locking device according to the invention;

Figure 10 is a cross section along the line X—X in Figure 9.

As may be seen from Figure 1 a container 2 has doors 4 on one narrow side and a detachable roof cover in the form of a flat insert top 6. The top cover 6 consists of a skeleton frame 18 with a lining, e.g., of sheet metal or impregnated water proofed plywood.

As may be seen from Figure 2 the upper rim of the container forms an L-shaped profile 8 with a horizontal, inwardly directed leg 10 forming a rebate providing an inwardly directed horizontal ledge or surface 14. At the end of the horizontal leg 10, the wall 12 extends beyond the upper surface 14 of the horizontal leg and forms a sealing strip 16.

The outer frame of the cover 6 has on its inside an angular profile 20 forming a groove or channel for a rubber strip 22 which co-operates with the sealing strip 16. The lower end of the frame 18 projects beyond the lower plane of the rubber strip 22 and rests on the surface 14 of the horizontal leg 10 of the profile; consequently the weight of the cover rests directly on the profile 8 and the arrangement provides a constant sealing pressure between the sealing strip 16 and the rubber strip 22.

Small drain pipes 24 pass through the profile 8 between the corners, at intervals

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90

95

100

105

110

115

120

125

130

for draining the space between the cover 6 and the profile 8.

As may be seen from Fig. 3 upwardly open pockets 26 are provided spaced over the circumference of the top cover 6 and house locking devices 28 for locking the top cover.

These pockets are formed by edge profiles 30 and a base plate 32 as shown in the cross section in Fig. 4.

On the outside of the cover frame 18 there are arranged on both sides of an opening 34 in the frame two parallel plates 36 which are chamfered towards the bottom and may therefore also act as guide plates when the cover is lowered on to the rim of the container. A locking lever 40 is mounted pivotably about a spindle 38 between the two plates 36; preferably this lever 40 consists of two identical parts mounted in spaced relationship from each other. A connecting link 42, hinged to the locking levers at 44, engages between the two parts of the lever. The other end of this link 42 is connected by a joint 46 with a U-shaped end portion 48 of a manual lever 50, having an angled end. The manual lever 50 is provided with a hinge pin 52 projecting on both sides of the manual lever. These projecting ends cooperate with a mounting slot 54 formed in two mutually spaced bearing plates 56 mounted on both sides of the manual lever on the bottom 32 of the pocket.

Opposite the openings 34 in the top frame 18, pockets 58 are formed to receive the pivotable locking lever. The section 60 of the profile 8 leading to this pocket is so formed that a bar 62 remains on the upper edge of this recess.

The end of the pocket 26 terminates in a pot shaped housing 64 with a bore 66 in the bottom; a pot shaped rubber part 68 with a hole 70, aligned with the hole 66 but smaller than the same, is arranged therein. The end of the angled portion of the lever 50 carries a ball head 72.

As may be seen from the lower part of Fig. 4, in the unlocked position, the end portion 48 of the lever 50 is lifted out of the bearing slots 54 and the ball head end of the manual lever 50 is pushed into the holes 66 and 70 in the manner of a press stud, so that the lever 50 is firmly located in this position. The locking lever 40 is thus pulled back so that it is inside the outer profile of the cover 6. For locking the cover the manual lever 50 is released and hooked with its bearing pins 52 into the mounting slots 54, with the lever 50 standing substantially vertically upwards. When the lever 50 is pivoted in an anticlockwise direction about the pins 52, the locking lever 40 is swivelled into the pocket 58 of the profile 8 by means of the link 42 and it pressed against its top. During this movement the

hinge joint 46 passes beyond the dead centre position between the joints 52 and 44, so that the end of the manual lever is pushed against the bottom 32 of the pocket 26 and no further locking is necessary. The lug 62 prevents the locking member of the locking lever 40 from being disengaged from the profile 8 in consequence of flexing of the container walls.

As shown in Fig. 3, the pockets nearest the corner of the top cover are provided with securing eyelets 74. These eyelets 74 are connected by fixing members 76 in which they are pivotally mounted, firmly with the bottom 32 of the pocket. The arrangement of the fixing members is such that in the inoperative position the securing eyelets 74 are below the handle 50. Thus the securing eyelets can be raised into the operating position only after the release of the locking mechanism so that lifting tackle can be attached to the top cover only after it has been effectively released.

With long containers, for example containers with the length of 40 ft., it may happen that particularly the long walls may be affected by an outwardly directed pressure, for example in consequence of a freight shifting at sea which may lead to a certain deformation of the rim 8. The locking device of Fig. 4 can counter such a deformation only when the lug of the locking lever abuts against the bar 62.

Fig. 5 shows an arrangement in which the locking lever provides components acting both vertically and transversely. In this embodiment an additional arm 82 is arranged between the two spaced apart side portions 78 of the locking lever and is pivotably about an axis 80; this arm 82 carries the locking lug 84 equipped with an oblique mounting surface, forming for example an angle of 45° with the vertical and cooperating with a correspondingly oblique surface on a bar 86 located above the upper part of the pocket opening 60. The locking lug 84 is biased by a stack of plate springs 88 resting on a cross bar 90 between the two locking lever side members 78. The division of the locking lever and the spring stack make it possible to move the manual lever beyond the dead centre position even if the side wall of the container has been slightly bent outwardly before the top cover is fitted.

It is also possible to provide additional transverse locking members such as shown in Figs. 6 and 7. In this construction mounting plates 92 are arranged on the inside of the cover frame 18; a manual lever 96 is adapted to swivel in a hinge 94 and is connected by a joint 98 with a pull rod 100 having hammer head shape ends.

The profile 8 is again equipped with a pocket 102, opening both upwardly and

towards the cover, into which pocket the hammer head shaped end of the pull rod 100 can be introduced. The pocket 102 is provided to this end with elastic members 104 in the receiving spaces, and forming the abutment.

As shown in Fig. 7 the outer frame 18 of the cover has a recess 106 for the passage of the pull rod 100. After releasing the transverse lock, the pull rod may be pivoted through this recess 106 into the pocket so that it rests above the manual lever 96. In the embodiment of Fig. 8, an upper cross spar 108 of the door is detachable from the container and firmly connected with the cover. After lifting the cover 6 it is possible to enter the container through the door opening with fork lift trucks having a height higher than that of the container. The mounting of the upper door cross spar 108 on the top cover 6 eliminates any additional mechanisms for detaching this upper cross spar of the door.

As has become apparent in practice, the side posts of the door which are free standing when the upper door spar has been lifted, tend to incline towards the inside or outside during the loading. Consequently, reliable closing of the door and roof cannot always be guaranteed. In order to provide means for restoring inclined door posts to their original structural position, a locking rod 112 is provided between the upper ends of the door posts 110. As described in detail in the following, this locking bar 112 is mounted pivotably and detachably at one end so that it can be positioned in a recess 114, arranged parallel to one of the door posts 110 during the loading or unloading of the container, as shown in Fig. 3.

Figs. 9 and 10 show this arrangement in detail. The profiles of the door posts 110 each have a pocket 116 below the front end of the profile 8; an arm 120 is pivotally mounted about a vertical axis 118 in this pocket 116.

The locking rod 112 comprises a tubular part 122 in the left end of which a bush 124 is located; a pin 126 is rotatable in this bush and carries a forked head 128, so that the pin 126 is pivotally connected through a link member 130 with the pivot arm 120. The other end of the tube 122 carries a threaded bush 132 into which is screwed a spindle 134, equipped with a fork head 136 connected by a link member 138 with the right hand pivoting arm 120. The tube is equipped with two transverse bores 140, offset by 90° and lined with bushes serving to receive rods, whereby the tube can be rotated.

The spindle 134 is provided with a mark 142 indicating the nominal distance between the door posts 110. In the embodiment shown in the drawing, the left hand link

member 130 is detachable and may be equipped, for example with a handle, not shown in the drawing. After releasing the link member 130, the locking bar 112 can be swivelled downwards and fitted with the right hand arm 120 into the recess 114.

The left hand pivoting arm 120 may also be swung sideways to the dot-dash line position leaving a completely unobstructed free passage.

After the loading the locking rod 112 is hooked into the left hand swivel arm 120 and the tube 122 is rotated until the distance between the door posts reaches the structural dimension; the bar 112 may either operate as a pulling or a pushing member and the structural dimension may easily be ascertained by means of the marking 142.

WHAT I CLAIM IS:—

1. A freight container comprising a detachable top cover in the form of a substantially flat insert with a skeleton frame and a lining, having on the underside of its periphery a U-shaped groove or channel with a resiliently deformable seal embedded therein, the outer leg of the groove or channel extending beyond the surface of the seal and the upper edge of the container being formed with a rebate providing an inwardly directed horizontal ledge and having an upstanding sealing lip for cooperating with the seal, and including manually operated locking devices arranged in upwardly opening pockets distributed adjacent the periphery of the cover.

2. A freight container as claimed in Claim 1, in which the locking devices each consist of a locking lever hinged to the cover, the reaction at the hinge producing a substantially vertically downwardly directed locking force, said locking levers being adapted to be swung into the profile of the cover, and a pivotally mounted manual lever, the two levers being so connected by a link member that, in the locked position, the hinge joint between the manual lever and the connecting link moves beyond a dead centre position defined by the pivot for the manual lever and the hinge for the locking lever, and including pockets opening towards the cover in the rebate opposite the locking levers, and forming an abutment for the locking levers.

3. A freight container as claimed in Claim 2, in which the hinge joint of the manual lever is demountable.

4. A freight container as claimed in Claim 3, in which the manual lever has laterally projecting hinge pins and in which upwardly open bearing sockets are provided for the manual lever in spaced apart bearing plates on the cover.

5. A freight container as claimed in Claim 3 or 4, in which the end of the manual

lever is angled and has a ball head shaped end, and in which the cover pockets have a ball head recess, spaced behind the support point for the manual lever in the locked position, and adapted to receive the ball head of the manual lever.

6. A freight container as claimed in any one of the preceding claims, in which the cover pockets nearest the corners of the top cover have lifting eyelets pivotally mounted on the bottom of the pockets.

7. A freight container as claimed in Claim 6, in which each hinge for the lifting eyelets is so arranged arranged that in the locked position the eyelet is underneath the manual lever.

8. A freight container as claimed in any preceding claim, in which transverse locking mechanisms are provided, arranged in upwardly open pockets in the cover and having a pivotable manual lever hinged to the cover and a pull rod hinged to the manual lever, wherein the pull rod is adapted to engage in the rebate of the container.

9. A freight container as claimed in Claim 8, in which the end of the pull rod has the shape of a hammer head and in which the rebate has an upper pocket open towards the cover and equipped with spaced apart, resilient abutments.

10. A freight container as claimed in Claim 2, or any of Claims 3—9 and Claim 2, in which the locking lever has a resiliently supported lug whose abutment surface is inclined both to the vertical and to the horizontal, and wherein the rebate has an abutment with an inclined abutment surface.

11. A freight container as claimed in Claim 10, in which the locking lever has two spaced apart locking jaws with a locking lug being mounted thereinbetween pivotably

about the pivot axis thereof, and including a spring arranged between the locking lug and the cross-member connecting the two locking jaws. 45

12. A freight container as claimed in any preceding claim, in which an upper door cross spar is firmly mounted on the top cover. 50

13. A freight container as claimed in Claim 12, in which a locking rod is pivotally mounted on a swivel arm fixed to a door post and into which rod a screwed spindle is engaged, said spindle being connected by means of a swivel arm to a second door post. 55

14. A freight container as claimed in Claim 13, in which the connection between the locking rod and one of the swivel arms is detachable. 60

15. A freight container as claimed in Claim 13 or 14, in which the screwed spindle is equipped with a marking indicating the normal dimension between the door posts. 65

16. A freight container, substantially as hereinbefore described with reference to and as illustrated in Figures 1 to 4 of the accompanying drawings.

17. A freight container, substantially as hereinbefore described with reference to and as illustrated in Figures 5 to 7 of the accompanying drawings. 70

18. A freight container, substantially as hereinbefore described, with reference to and as illustrated in Figures 8, 9 and 10 of the accompanying drawings. 75

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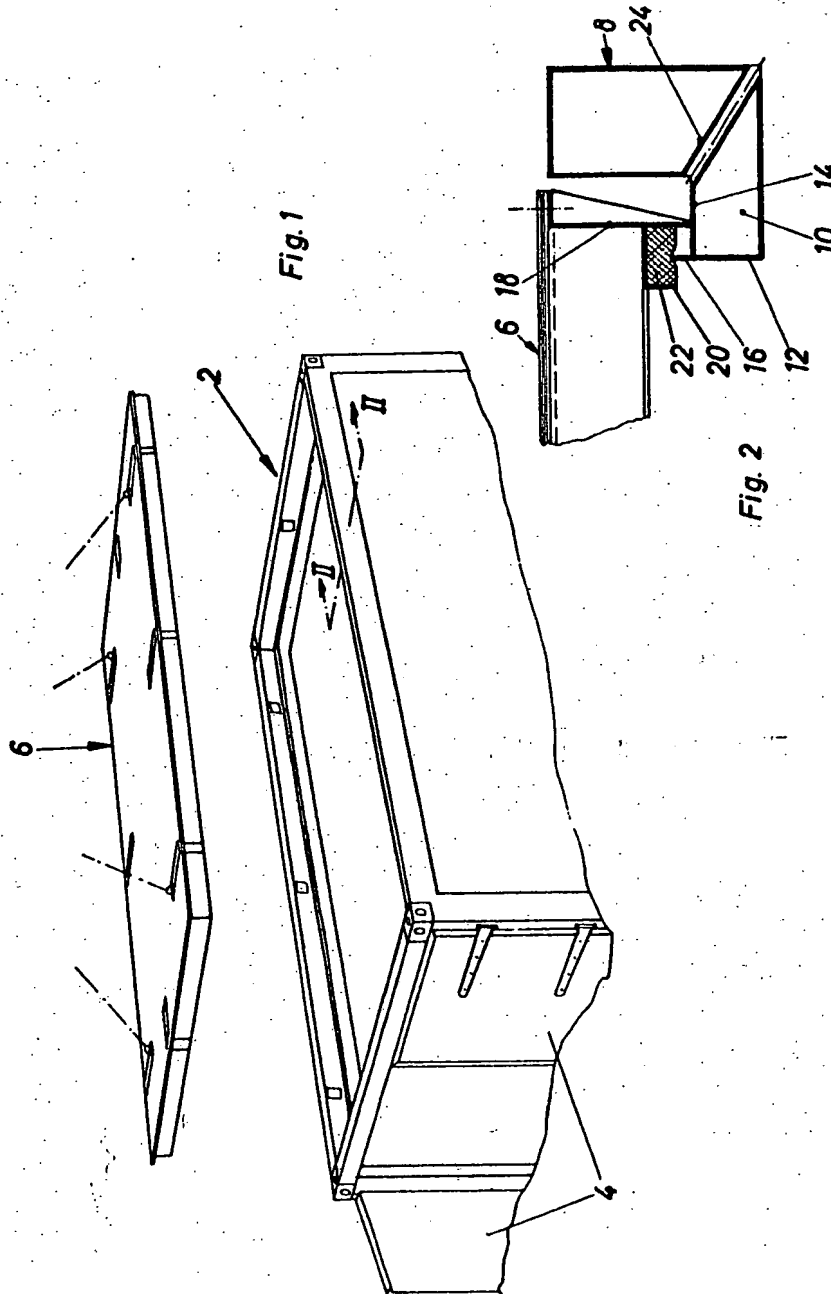
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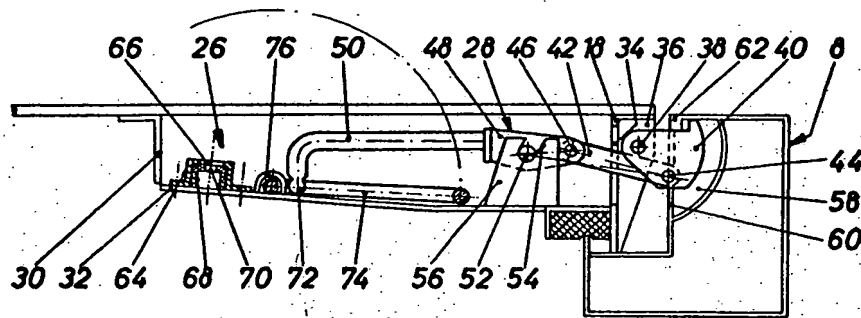


Fig. 4

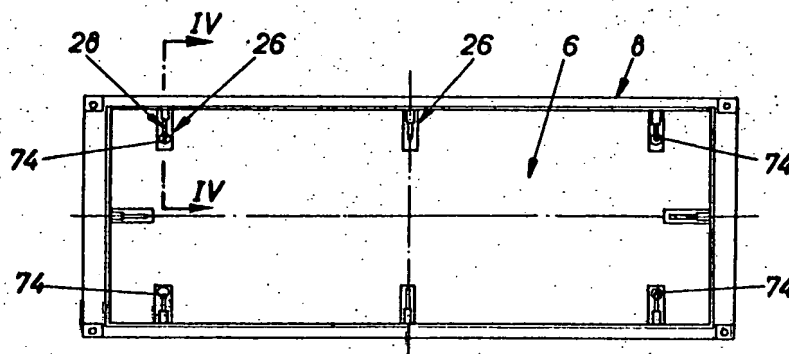
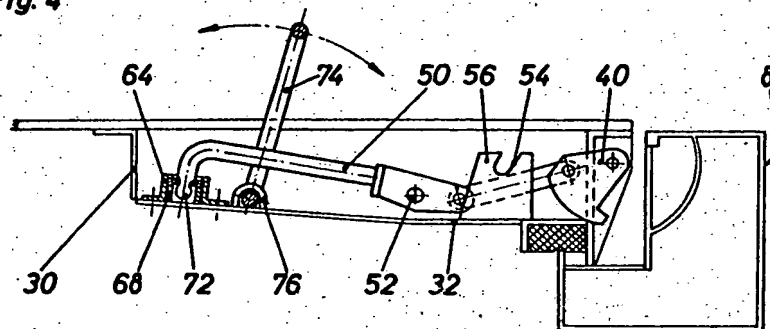


Fig. 3

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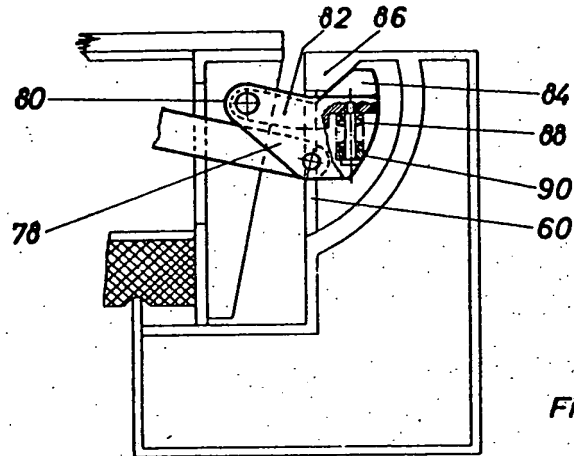


Fig. 5

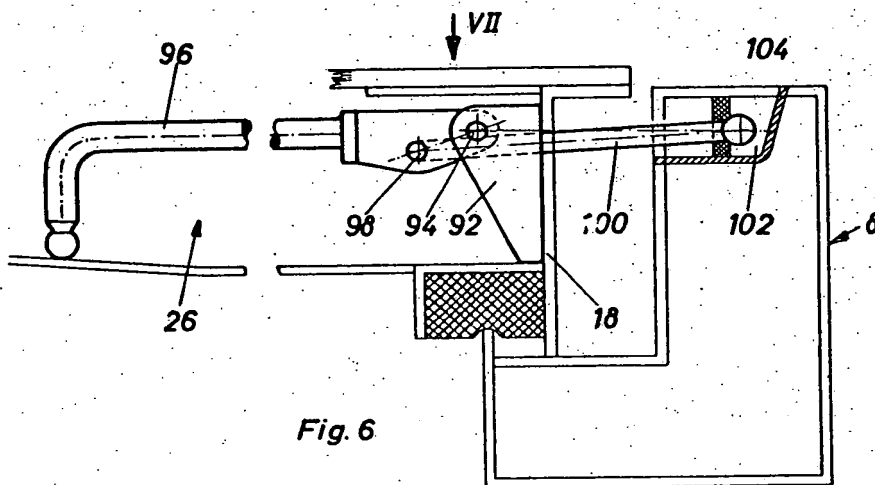


Fig. 6

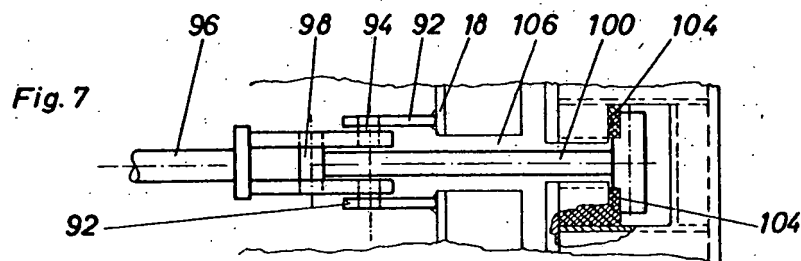


Fig. 7

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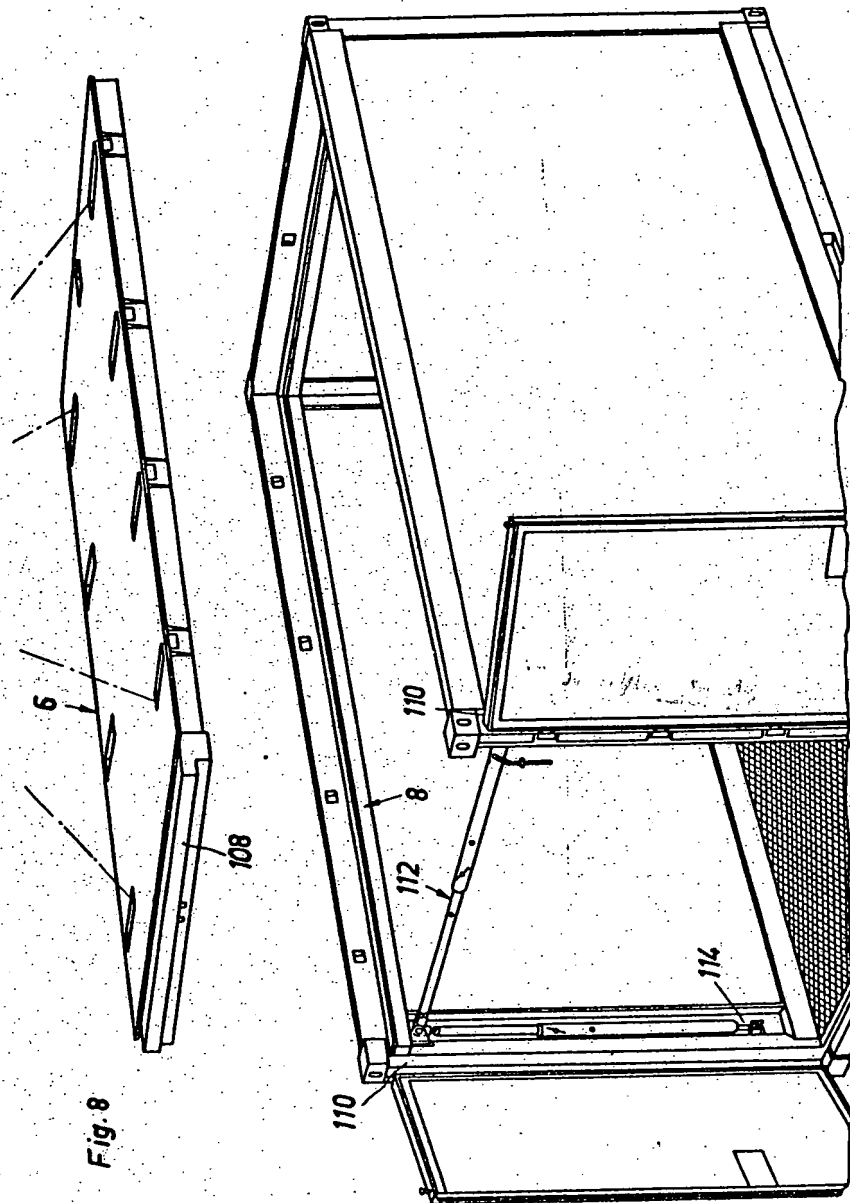


Fig. 8

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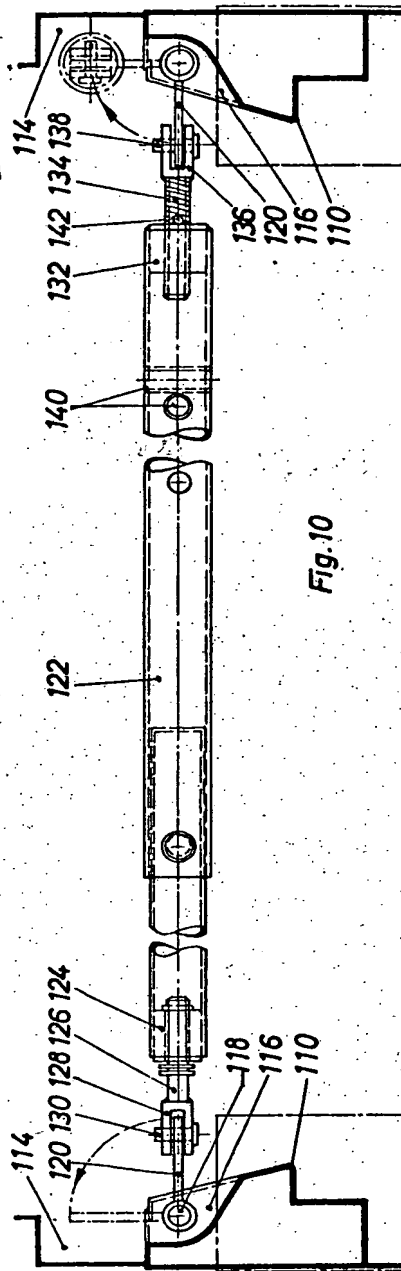
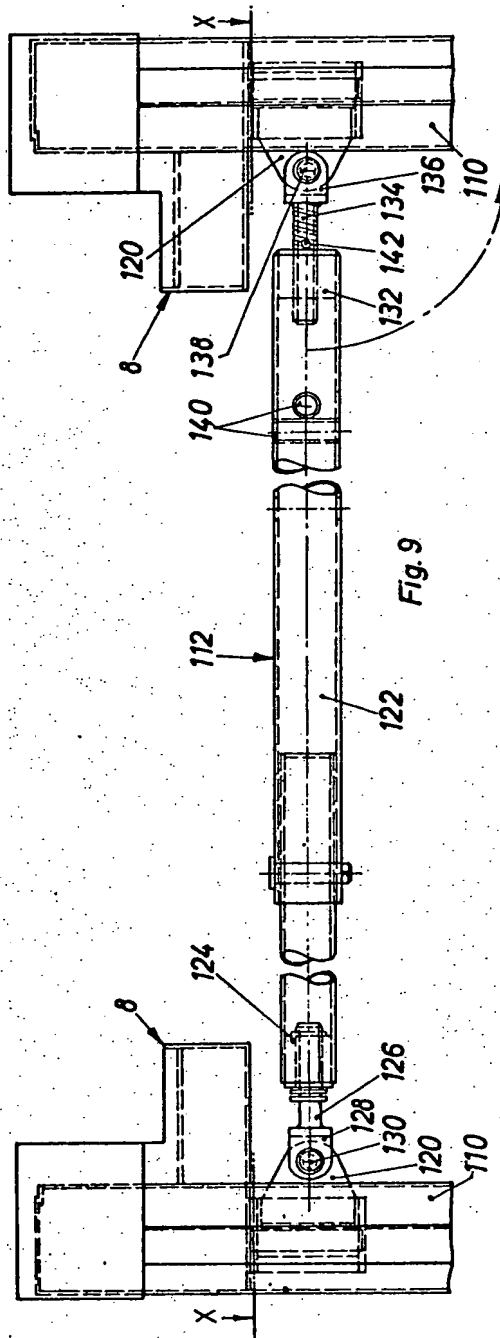
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Sheet 5



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